

Claims

[c1] 1.A method for identifying images of laser stripes projected onto the surface of an object in a non-contact gauge measurement system, comprising:
projecting one or more laser stripes onto a surface of an object;
obtaining an image of said projected laser stripes;
generating a matched filter for each pixel in said image;
filtering said image with said generated matched filter; and
identifying the center of said projected laser stripes in said filtered image.

[c2] 2.The method of Claim 1 for identifying images of laser stripes wherein the step of generating a matched filter for each pixel in said image includes the step of calculating:

$$v(i, j) = \sum_R (image(r) \times gaussian(r))$$

for each pixel (i,j) in said image, wherein image(r) is the image intensity value for a point on a curve R that emanates from pixel (i,j), and is always tangential to the flow field.

[c3] 3.The method of Claim 2 for identifying images of laser stripes wherein the step of generating a matched filter for each pixel in said image includes the step of calculating:

$$t(i, j) = \sum_P (v(p) \times gaussian(p))$$

for each pixel (i,j) in said image, wherein P is a curve that emanates from pixel (i,j), and is always perpendicular to the flow field.

[c4] 4.The method of Claim 3 for identifying images of laser stripes wherein the step of identifying the center of said projected laser stripes in said filtered image includes, for each raster line in said image, identifying pixels where t(i,j) is a local maximum with respect to said raster line.

[c5] 5.The method of Claim 1 for identifying images of laser stripes wherein the step of generating a matched filter for each pixel in said image calculates a two-dimensional matched filter for each pixel in said image.

[c6] 6.The method of Claim 1 for identifying images of laser stripes wherein the step of generating a matched filter for each pixel in said image includes calculating a first one-dimensional filter for each pixel and calculating a second one-dimensional filter for each pixel.

[c7] 7.The method of Claim 6 for identifying images of laser stripes wherein said first and second one-dimensional filters are each separable gaussian filters.

[c8] 8.The method of Claim 6 for identifying images of laser stripes wherein said first and second one-dimensional filters are each separable non-gaussian filters.